

CLAIMS

1. A combustion apparatus comprising:
a burner burning a fuel within a furnace in a theoretical air ratio or less; and
an air port arranged in a back flow side of the burner and injecting a combustion air for a shortfall in the burner into the furnace,
wherein an inhibiting gas supply means for supplying a nitrogen oxide generation inhibiting gas inhibiting a nitrogen oxide from being generated is provided in a mixing region formed by both of a combustion gas generated by burning the fuel by means of said burner and a combustion air injected from said air port or near the mixing region.
2. A combustion apparatus as claimed in claim 1, wherein an inner side of said air port is separated into a flow path injecting said combustion air, and a flow path injecting said nitrogen oxide generation inhibiting gas.
3. A combustion apparatus as claimed in claim 1 or 2, wherein said nitrogen oxide generation inhibiting gas is constituted by at least one gas selected from a group comprising a combustion exhaust gas, a mixed gas of the combustion exhaust gas and the air, and the air.
4. A combustion apparatus as claimed in any one of claims 1 to 3, wherein said inhibiting gas is injected into the furnace from an outer peripheral portion side of an air injection port of said air port.

5. A combustion apparatus as claimed in any one of claim 1 to 4, wherein said inhibiting gas injection port is formed in an annular shape so as to surround the air injection port of said air port.
6. A combustion apparatus as claimed in any one of claims 1 to 4, wherein a plurality of said inhibiting gas injecting ports are arranged in a peripheral direction so as to surround the air injection port of said air port.
7. A combustion apparatus as claimed in any one of claim 1 to 4, wherein said inhibiting gas injection port is formed approximately in a circular arc shape so as to surround a part of the air injection port of said air port.
8. A combustion apparatus as claimed in any one of claims 1 to 4, wherein a plurality of said inhibiting gas injection ports are concentrically arranged in a part of an outer peripheral portion of the air injection port of said air port.
9. A combustion apparatus as claimed in claim 7 or 8, wherein said inhibiting gas injection port is arranged in the burner side of the air injection port of said air port.
10. A combustion apparatus as claimed in any one of claims 1 to 9, wherein a system for supplying a part of the exhaust gas recirculation within said furnace as the nitrogen oxide inhibiting gas in a branched state.
11. A combustion apparatus as claimed in claim

10, wherein a blower exclusive for the inhibiting gas is placed in said inhibiting gas supply system.

12. A combustion apparatus as claimed in claim 10, wherein said inhibiting gas is constituted by an exhaust gas after a temperature thereof is lowered by a heat exchanger.

13. A combustion apparatus as claimed in any one of claims 1 to 12, wherein a plurality of air ports are placed along a width direction of said furnace, and each of the air ports is provided with said inhibiting gas supply means and a flow rate regulating means for regulating a flow rate of the inhibiting gas.

14. A combustion apparatus as claimed in any one of claims 1 to 13, wherein a plurality of air ports are placed along a width direction of said furnace, each of the air ports is provided with said inhibiting gas supply means, and the inhibiting gas is supplied more to the air port close to the furnace center portion than the air port close to the furnace side wall in a plurality of air ports.

15. A combustion apparatus as claimed in claim 13 or 14, wherein a total supply flow rate of the inhibiting gas supplied to said plurality of air ports is variable in correspondence to a load of said combustion apparatus.

16. A combustion apparatus as claimed in claim 13 or 14, wherein a total supply flow rate of the inhibiting gas supplied to said plurality of air ports

is variable in correspondence to a nitrogen oxide discharging concentration of said combustion apparatus.

17. A wind box having an air port arranged in a back flow side of a burner and supplying a combustion air which corresponds to a shortfall in the burner, wherein an inhibiting gas wind box for supplying an inhibiting gas inhibiting generation of a nitrogen oxide is provided in a mixing region formed by both of a combustion gas generated by burning a fuel by means of said burner and a combustion air injected from said air port or near the mixing region, within the wind box for the air port.

18. A wind box as claimed in claim 17, wherein an air port wind box which is common to a plurality of said air ports is provided, and an inhibiting gas wind box which is common to said plurality of air ports is provided within the air port wind box.

19. A wind box as claimed in claim 17, wherein an air port wind box which is common to a plurality of said air ports is provided, and inhibiting gas wind boxes which are individual to said plurality of air ports is provided within the air port wind box.

20. A wind box as claimed in claim 17, wherein an inhibiting gas injection port of said inhibiting gas wind box is provided in an outer peripheral portion side of an air injection outlet of said air port.

21. A wind box as claimed in claim 20, wherein said inhibiting gas injection port is formed in an

annular shape so as to surround the air injection port of said air port.

22. A wind box as claimed in the claim 20, wherein a plurality of said inhibiting gas injection ports are arranged in a peripheral direction so as to surround the air injection port of said air port.

23. A wind box as claimed in claim 20, wherein said inhibiting gas injection port is formed in an approximately circular arc shape so as to surround a part of the air injection port of said air port.

24. A wind box as claimed in claim 20, wherein a plurality of said inhibiting gas injection ports are arranged concentrically in a part of an outer peripheral portion of the air injection port of said air port.

25. A wind box as claimed in claim 20, wherein said inhibiting gas injection port is arranged in a burner side of the air injection port of said air port.